REMARKS

Reconsideration and allowance of this application, as amended, is respectfully requested.

This Amendment is in response to the Office Action dated September 24, 2003.

By the present amendment, independent claim 9 has been canceled, without prejudice to the applicants' right to proceed with the subject matter of this claim by way of a continuation application. Independent claim 1 has been replaced by new independent claim 10 for purposes of clarifying the invention. The dependent claims have been correspondingly amended to depend from the new independent claim 10 and to provide proper antecedent basis to the terminology used in claim 10. In addition, new independent claims 11 and 12 have been added to define the invention in terms of a means plus function format.

Briefly, features of the present invention defined by the new independent claims 10 and 11 and the dependent claims 2-8 are directed to resolving a problem which the inventors discovered in their studies of conventional brake devices using actuators for generating a brake force by electric power. As discussed beginning on page 3, line 1, conventional brake devices of this type include both a vehicle motion controller and a drive controller arranged on a vehicle body side (referred to in the Specification as a spring-mass). The actuator, and various sensors, on the other hand, are located on the wheel side (referred to in the Specification as an unspring-mass). As noted on page 3, line 4 *et seq.,* the spring-mass vehicle body side is constructed of the body, the engine and a transmission etc. The unspring-mass

wheel side, on the other hand, is constructed by elements such as the suspension, knuckles, axle, wheels, etc., (*e.g.,* page 3, line 11-13).

The problem with the prior art system in which both the drive controller and the vehicle motion controller are located on the spring-mass vehicle body side is that a large number of wires is necessary to communicate between the sensors, the drive controller, the vehicle motion controller and the actuator. As discussed beginning on page 3, lines 14 *et. seq.,* because the drive controller and the vehicle motion controller are located on the spring-mass vehicle body side whereas the sensors and the actuator are located on the unspring-mass wheel side of the vehicle side, relative displacement occurs between these elements. Thus, any electrical communication between these elements requires expensive bending cables which are capable of operation in spite of road hazards, freezing and substantial deformation. This substantially increases the cost of such electrically operated braking devices, as discussed on page 4, line 4 *et. seq.*

In order to substantially decrease these expenses, applicants developed a system such as shown, for example, in the embodiment of Fig. 1 (noting that reference to Fig. 1 is solely for purposes of example, and not intended to limit the present claims only to the specifics of this embodiment). As shown in Fig. 1, the drive controller 6 is located on the unspring-mass wheel side of the vehicle together with the sensors 31-37 and the actuator 7. The sensors 31-37 are discussed, for example, on page 11, and these sensors are connected to the sensor input circuit 65 of the drive controller 6 via lines 41-47, as discussed on page 12, line 6 *et. seq.* Because the sensors, actuator and drive controller 6 are all on the same unspring-mass wheel side, it is not necessary to use the expensive bending cable to

communicate between these elements. Thus, the flexible bending cable 53 which is used in the embodiment of Fig. 1 (and shown in detail in Fig. 2) to communicate between the drive controller 6 and the vehicle motion controller 4 on the spring-mass vehicle body side can be much simpler than that of the prior art arrangements. In particular, as set forth on page 12, line 13 *et. seq.* of the Specification:

> "*By electrically connecting a plurality of sensors to the drive controller 6 having the multiplex communicating function, the number of signal lines can be reduced to a value smaller than that in the case where the signal of each sensor is connected to the spring-mass by a dedicated signal line.*"

Reconsideration and allowance of new independent claim 10 and its dependent claims 2-8 over the cited prior art to Tamasho (USP 6,397,981), Horn (USP 6,109,702), Sinn (USP 6,142,580) and Paielli (USP 6,384,721) is respectfully requested. With regard to this, new independent claim 10 clearly defines the arrangement of the present invention in which the sensor device and the drive controller are both located on the unspring-mass wheel side of the vehicle, together with the actuator, while the vehicle motion controller is located on the spring-mass vehicle body side of the vehicle. It is noted that the terms "unspring-mass wheel side" and "spring-mass vehicle body side" are clearly defined in the Specification on page 3, line 1 *et. seq.* It is also respectfully submitted that none of the cited prior references teach or suggest this specific claimed arrangement with the sensors, actuator and drive controller all being located on the unspring-mass wheel side of the vehicle while the vehicle motion controller is located on the spring-mass vehicle body side of the vehicle. In light of this, reconsideration and allowance of independent claim 10 and its dependent claims 2-8, which define even further distinctions over the cited prior art, is respectfully requested.

Reconsideration and allowance of newly presented independent claims 11 and 12 over the cited references is also respectfully requested. Claim 11 contains the same features of independent claim 10, except for defining the invention in terms of the means plus function format, as permitted under 35 USC §112, sixth paragraph. As such, claim 11 defines these features in even further detail in accordance with the teachings set forth, for example, by the CAFC in the case of *In Re Donaldson, 29 USPQ 2d 1845* (Fed. Cir. 1994). On the other hand, new claim 12 defines the specific feature of the invention of reducing the number of bending cables necessary to communicate between the various elements in a means plus function format. The prior art is completely devoid of any such recognition of a means for reducing the number of such bending cables required for the electrical communication. Accordingly, for the reasons set forth above, reconsideration and allowance of new independent claims 11 and 12 is also respectfully requested.

If the Examiner believes that there are any other points which may be clarified or otherwise disposed of, either by telephone discussion or by a personal interview, the Examiner is invited to contact the undersigned representative at the number indicated below.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including Extension of Time fees, to the Antonelli, Terry, Stout &

Kraus, LLP, Dep. Acct. No. 01-2135 (Docket No. 500.41154X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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APPENDIX

ABSTRACT OF THE DISCLOSURE

A brake device includes an actuator which is provided on a wheel side of a vehicle having a suspension, the actuator generates a braking force by being electrically driven. A drive controller is also provided for receiving a signal regarding the braking force from a vehicle motion controller and sensors, and driving the actuator accordingly. To reduce the number of high cost bending wires necessary to communicate between the sensors, the drive controller and the vehicle motion controller, the drive controller and the sensors are attached to the actuator side (unspring-mass) and the drive controllercommunicates with the vehicle motion controller provided on the vehicle body side (spring-mass) of the vehicle by bidirectional multiplex communication.